AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claim 1 (currently amended): A semiconductor laser comprising:

- an active region (12) which, in response to a pumping energy applied thereto, produces a stimulated emission of radiation with a central wavelength (λ) in the far infrared region, and

- at least one confinement region (16, 18, 22) for confining the radiation in the active region (12) and comprising at least one interface (16a, 16b, 22a) between adjacent layers for supporting surface plasmon modes generated by an interaction of the interface with the radiation,

wherein

the at least one confinement region (16, 18, 22) comprises a wave-guide layer (16) which is delimited on opposite sides by a first interface and by a second interface (16a, 16b), the guide layer (16) being doped in a manner such that the first and second interfaces (16a, 16b) support the plasmon modes, respectively, and the guide layer (16) being of a thickness (d) such as to bring about the accumulation of the plasmon modes in proximity to the first and second interfaces (16a, 16b), outside the layer (16), and substantially a suppression of the plasmon modes, inside the layer, wherein the mode intensity of the plasmon modes in proximity to the second interface (16b) is ~~comparable tp~~ similar to the mode intensity of the plasmon modes in proximity to the first interface (16a).

Claim 2 (previously presented): A laser according to Claim 1 wherein the plasmon modes of the first and second interfaces (16a, 16b) are mutually coupled.

Claim 3 (previously presented): A laser according to Claim 2 wherein the wave-guide layer (16) has a dielectric constant (ε_1) with a negative real part and is interposed between regions (12, 18) having respective dielectric constants (ε_2 and ε_3) with a positive real part but with a modulus substantially of the same order as the modulus of the dielectric constant (ε_1) of the guide layer.

Claim 4 (previously presented): A laser according to Claim 3 wherein the real part of the sum of the dielectric constant of the guide layer (16) and the respective dielectric constants of the regions (12, 18) between which the guide layer is interposed is substantially of the order of the imaginary part of the sum.

Claim 5 (previously presented): A laser according to claim 1 wherein the active region (12) comprises a quantum-cascade active region.

Claim 6 (previously presented): A laser according to Claim 5 wherein the active region comprises a structure with GaAs/$Al_{0.15}Ga_{0.85}As$ superlattices of non-uniform period.

Claim 7 (previously presented): A laser according to claim 1 wherein the guide layer (16) is interposed between the active region (12) and a substrate region (18).

Claim 8 (previously presented) A laser according to Claim 7 wherein the wave-guide layer (16) is in contact with the active region (12).

Claim 9 (previously presented) A laser according to claim 1, further comprising a first electrical contact region (20) disposed directly on the guide layer (16).

Claim 10 (previously presented): A laser according to claim 1, further comprising a second electrical contact region (22) disposed directly on the active region (12).

Claim 11 (previously presented): A laser according to claim 1, wherein the laser produces a stimulated emission of radiation with a frequency of between 1 and 10 THz.

Claim 12 (previously presented) A laser according to claim 1 wherein the thickness (d) of the wave-guide layer (16) is of the order of 100 nm.

Claim 13 (previously presented) A laser according to claim 1 wherein the wave-guide layer (16) is formed by an n-type semiconductor in which the concentration of electrons is of the order of 10^{18} cm^{-3}.